MARY GAGE PETERSON ELEMENTARY

Science at Peterson

Starting with the 2026-2027 school year, Peterson will be using a free, open-source, high quality science curriculum called OpenSciEd. See below for more details and how you can support your student with science at Peterson.

OpenSciEd (OSE)
OpenSciEd is a grant-funded curriculum that was built from the ground up around the 3-dimensional Next Generation Science Standards. It is phenomenon-based and uses student questions as a starting point for investigation. Students are not simply told answers to scientific questions; instead they are motivated to figure out what's in front of them, guided by their teacher. Parents and caregivers are invited to support their students' scientific growth by asking questions that push their child's thinking, and allowing each child to ask questions, investigate, and figure out explanations for themselves.

OpenSciEd 6-8th Scope and Sequence		
6th Grade	6.1 Light & Matter	6.2 Thermal Energy
	6.3 Weather, Climate, & Water Cycling*	6.4 Plate Tectonics & Rock Cycling
	6.5 Natural Hazards*	6.6 Cells & Systems
7th Grade	7.1 Chemical Reactions & Matter	7.2 Chemical Reactions & Energy
	7.3 Metabolic Reactions	7.4 Matter Cycling & Photosynthesis
	7.5 Ecosystem Dynamics	7.6 Earth's Resources & Human Impact*
8th Grade	8.1 Contact Forces*	8.2 Sound Waves*
	8.3 Forces at a Distance	8.4 Earth in Space
	8.5 Genetics	8.6 Natural Selection & Common Ancestry

*Denotes a unit with an opportunity to incorporate computer science standards

7th Grade	
Unit Name	**Unit Description**
7.1 Chemical Reactions & Matter *How can we make something new that was not there before?*	Seventh grade chemistry students' conceptual understanding of chemical reactions for middle school science is foundational to much science learning. Understanding atomic level reactions is crucial for learning physical, life, earth, and space science. Even more importantly, they open up new windows of curiosity for students to see the world around them. By seventh grade, students are ready to take on the abstract nature of the interactions of atoms and molecules far too small to see. To pique 7th grade students' curiosity and anchor the learning for the unit in the visible and concrete, students start with an experience of observing and analyzing a bath bomb as it fizzes and eventually disappears in the water. Their observations and questions about what is going on drive learning that digs into a series of related phenomena as students iterate and improve their models depicting what happens during chemical reactions for middle school science. By the end of the unit, students have a firm grasp on how to model simple molecules, know what to look for to determine if chemical reactions have occurred, and apply their knowledge to chemical reactions to show how mass is conserved when atoms are rearranged.
7.2 Chemical Reactions & Energy *How can we use chemical reactions to design a solution to a problem?*	In this unit, students are introduced to the anchoring phenomenon—a flameless heater in a Meal, Ready-to-Eat (MRE) that provides hot food to people by just adding water. In the first lesson set, students explore the inside of an MRE flameless heater, then do investigations to collect evidence to support the idea that this heater and another type of flameless heater (a single-use hand warmer) are undergoing chemical reactions as they get warm. Students have an opportunity to reflect on the engineering design process, defining stakeholders, and refining the criteria and constraints for the design solution. In the second lesson set, students develop their design solutions by investigating how much food and reactants they should include in their homemade heater designs and go through a series of iterative testing and redesigning. This iterative design cycle includes peer feedback, consideration of design modification consequences, and analysis of impacts on stakeholders. Finally, students optimize their designs and have another team test their homemade heater instructions.
7.3 Metabolic Reactions *How do things inside our bodies work together to make us feel the way we do?*	This unit on metabolic reactions in the human body starts out with students exploring a real case study of a middle-school girl named M'Kenna, who reported some alarming symptoms to her doctor. Her symptoms included an inability to concentrate, headaches, stomach issues when she eats, and a lack of energy for everyday activities and sports that she used to play regularly. She also reported noticeable weight loss over the past few months, in spite of consuming what appeared to be a healthy diet. Her case sparks questions and ideas for investigations around trying to figure out which pathways and processes in M'Kenna's body might be functioning differently than a healthy system and why. Students investigate data specific to M'Kenna's case in the form of doctor's notes, endoscopy images and reports, growth charts, and micrographs. They also draw from their results from laboratory experiments on the chemical changes involving the processing of food and from digital interactives to explore how food is transported, transformed, stored,

	and used across different body systems in all people. Through this work of figuring out what is causing M'Kenna's symptoms, the class discovers what happens to the food we eat after it enters our bodies and how M'Kenna's different symptoms are connected.
7.4 Matter Cycling & Photosynthesis *Where does food come from and where does it go next?*	This unit on the cycling of matter and photosynthesis begins with 7th grade students reflecting on what they ate for breakfast. Students are prompted to consider where their food comes from and consider which breakfast items might be from plants. Then students taste a common breakfast food, maple syrup, and see that according to the label, it is 100% from a tree. Based on the preceding unit, students argue that they know what happens to the sugar in syrup when they consume it. It is absorbed into the circulatory system and transported to cells in their body to be used for fuel. Students explore what else is in food and discover that food from plants, like bananas, peanut butter, beans, avocado, and almonds, not only have sugars but proteins and fats as well. This discovery leads them to wonder how plants are getting these food molecules and where a plant's food comes from. Students figure out that they can trace all food back to plants, including processed and synthetic food. They obtain and communicate information to explain how matter gets from living things that have died back into the system through processes done by decomposers. Students finally explain that the pieces of their food are constantly recycled between living and nonliving parts of a system.
7.5 Ecosystem Dynamics *How does changing an ecosystem affect what lives there?*	This unit on ecosystem dynamics and biodiversity begins with students reading headlines that claim that the future of orangutans is in peril and that the purchasing of chocolate may be the cause. Students then examine the ingredients in popular chocolate candies and learn that one of these ingredients--palm oil--is grown on farms near the rainforest where orangutans live. This prompts students to develop initial models to explain how buying candy could impact orangutans. Students spend the first lesson set better understanding the complexity of the problem, which cannot be solved with simple solutions. They will figure out that palm oil is derived from the oil palm trees that grow near the equator, and that these trees are both land-efficient and provide stable income for farmers, factors that make finding a solution to the palm oil problem more challenging. Students will establish the need for a better design for oil palm farms, which will support both orangutans and farmers. The final set of lessons engage students in investigations of alternative approaches to growing food compared to large-scale monocrop farms. Students work to design an oil palm farm that simultaneously supports orangutan populations and the income of farmers and community members.
7.6 Earth's Resources & Human Impact *How do changes in the Earth's system impact our communities and what can we do about*	This unit on Earth's resources and human impact begins with students observing news stories and headlines of drought and flood events across the United States. Students figure out that these drought and flood events are not normal and that both kinds of events seem to be related to rising temperatures. This prompts them to develop an initial model to explain how rising temperatures could cause both droughts and floods and leads students to wonder what could cause rising temperatures, too. This initial work sets students up to ask questions related to the query: How do changes in Earth's system impact our communities and what can we do about it? Students spend the first lesson set gathering evidence for how a change in temperature affects evaporation, precipitation, and other parts of Earth's water system. They use

it?	evidence to support a scientific explanation that two climate variables (temperature and precipitation) are changing precipitation patterns in the case sites they investigated. Students figure out that the rising temperatures are caused by an imbalance in Earth's carbon system, resulting in a variety of problems in different communities. The unit ends with students evaluating different kinds of solutions to these problems and how they are implemented in communities. Students work through a systematic evaluation process to consider (1) each solution's potential to solve the carbon imbalance, (2) tradeoffs associated with solutions based on student-identified constraints, and (3) whether the solution in question makes sense for their community's stakeholders.